

NORTH CENTRAL REGION HAWK

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Civil Air Patrol

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To Be Ready, Responsive, and Relevant

SEMPER VI

Fellowship- Getting into the Game

Effective followership is the essential element for team building. Considering every leader at one time or another spent considerable time as a follower, the job of an effective follower is more difficult than that of a leader. Followers must adapt their style, character, and beliefs to their leaders' as well as to their teammates, and the situation. When the activity is routine or non-critical, the role of follower is tough enough. In emergency services with an ever-changing situation, there will be an increased need for adaptability and flexibility.

According to R.E. Kelly (1988, A Two-dimensional Model of Follower Behavior), there are five types of followers:

- 'Yes' People- These followers usually inhibit good decision making, as they are likely to ignore proper feedback techniques and go right to agreeing with the leader, right or wrong. Such followers may be very skilled, but will not fully demonstrate the scope of their abilities as it could put them in disfavor with the leader if they error. They likely will not think independently at a time when valid input is needed from the entire team. 'Yes' People on a team can create dissent, because there is a tendency for the ineffective leader to favor them over others who may demonstrate more independence.
- Sheep- The followers who do not demonstrate active skill, clear thinking or assertive behavior are referred to as 'sheep'. They may have the skill needed on the team, but are not interested in providing input or feedback. The goal of sheep is to quietly do their job. The problem is that they are not very interested in doing anything beyond what is absolutely required of them. In the minds of 'sheep', doing nothing beyond the requirements is better than the chance of doing it wrong.
- Alienated Followers- Alienated followers are typically smart and clear thinkers, but are usually uninterested in contributing. Most will contain some sort of animosity towards the leader, other teammates, or to the organization. Their skills are usually in line with what the team needs, but their attitude can greatly disrupt the team effort and sabotage all principles of effective leadership.
- Effective Followers- Effective followers are usually smart and clear thinkers that either have the skills the team needs or are willing to learn. They are active team players, without being 'yes' people. They offer input that can improve the decision making process and raise the overall team situational awareness.
- Survivors- Followers that have attributes of all of the previous types of followers are called the survivors. They will typically be mediocre responders that can shift their behavior to all four types. They are more interested in not making waves, than promoting a more effective team. They are not likely to be disruptive, but will be a leader's unpredictable and underachieving followers.

Effective followers demonstrate three major skill areas:

- Active listening
- Active communications
- Assertiveness

Effective followers apply themselves to the needs of the team. To a good follower, a team is a series of links on a chain. The team will only be as strong as the weakest link and the good follower will not want to be that weak link.

Followership involves a member wanting to be the best they can be, with a goal of applying that ability and knowledge to a united team effort. Within the team effort, followership includes listening intently to what is being said and paying attention to what is going on about them. Followership is also participating in active input and feedback of information.

ALCYONEUS NOW

How to Assist in an Evacuation of a Community

It could be possible that in the consequence management of terrorism, people in urban or rural areas might be requested by government officials to evacuate their homes. An evacuation may be ordered when an area is threatened and there is time to evacuate safely and orderly, or following an emergency when there is eminent danger to people in their homes in the immediate area. The Civil Air Patrol may be asked to assist in such an effort. The goal of evacuation is to quickly move people to safe areas and shelter. Evacuation announcements will come through radio or television broadcasts. The announcement will include the time frame for evacuation and specify the safe haven/shelter evacuees will go to. In some cases the local authorities will advise the routes to take to get to the safe haven/shelter, and those items the people will be allowed to take with them. All evacuations are an open-ended time frame, so officials will not likely advise when the people will be allowed to return to their homes. Initiating an evacuation more often than not becomes a disaster in itself. The broadcasts will be the start of mass confusion and panic. The evacuation process is rarely as orderly as it appears on paper or in practice exercises. There may be traffic jams, vehicle accidents, and runs on grocery store inventories. People to be evacuated will fall into five categories:

- Those who will ignore the request for evacuation, choosing to stay in their homes, protecting their property.
- Those who will ignore an orderly evacuation to a safe haven or shelter area, choosing instead to evacuate on their own to wherever, whenever, and however they choose.
- Those who will not have heard the broadcast for evacuation and will be confused to what is going on around them.
- Those who will be panicked and not know what to do.
- Those who will be prepared to evacuate to the designated safe haven or shelter area in an orderly fashion.

In order to assist in the evacuation of an area to a safe haven and shelter, there are key points to remember for a successful evacuation of people from their homes:

- An evacuation of a community is a volunteer request. The request may be for the welfare of the people, but they do not have to evacuate if they do not wish to.
- In such a request to assist in an evacuation Civil Air Patrol forces are only there to assist and advise.
- If there is a forced evacuation of buildings and homes, the Civil Air Patrol cannot assist in the enforced evacuation due to Posse Commitatus.
- People evacuating their homes are facing the ultimate disruption of their comfort zone.
 - Assisting as a volunteer means being informative, understanding, and as sympathetic as possible.

- Since an evacuation is time critical, the information exchange, and sympathetic understanding must not delay the evacuation process.
- In most cases, each person to be evacuated may be allowed only one suitcase of clothing, their medication, and a sleeping bag if they have one available.
 - Pets are not allowed in a public shelter facility. They will not be allowed aboard transportation vehicles.
 - Only one suitcase per individual will be allowed to board with the evacuee. Excess suitcases must be left at home or discarded.

Evacuation Procedures:

- Each evacuation team should be composed of a driver and three escorts.
- At the evacuation briefing, obtain a detailed map of the evacuation area.
- Obtain a complete briefing that includes the following information:
 - The reason for the area evacuation
 - The projected weather and wind direction
 - Evacuation assignment area
 - Locations of shelter facilities or safe havens
 - Primary and alternate routes from evacuation area to shelters
 - The 'no later than' departure time from the evacuation area

When you get to the evacuation area have two of the escorts go to each home with the following information:

1. Authorities recommend evacuation.
2. Each evacuee is allowed to take one suitcase of necessities and a sleeping bag.
3. Advise each evacuee to take their appropriate medications with them to the shelter area.
4. Pets will not be allowed.
5. Before leaving shut off all electrical devices and gas.
6. Do not waste time calling friends or relatives. Calls can be made at the shelter facility.
7. The vehicle will return in 15 minutes to pick the evacuees up for transport. *
8. They are to secure and lock all doors when departing.
9. Suggest the wear long sleeve shirts, slacks, and sturdy shoes for the evacuation ride.
10. They will be able to return as soon as the emergency is over and it is safe to return.

* The CAP vehicle may or may not be authorized to transport evacuees. If the team does not have such authorization, then the vehicle could be used to be a leader of a convoy to the shelter area/safe haven.

After the transport is full of evacuees, drive to the shelter by the designated primary route. Take the alternate route only if the primary route is blocked. Return to the evacuation area using the alternate route for as many evacuees as possible before it no longer becomes safe.

For those people who do not want to travel with the evacuation transport, provide them with all the information they will need to safely arrive at a shelter area or safe haven.

CREW'S CONTROL

Making Your Own Luck

What is luck? How does a person get so lucky? Why is it better to be lucky than good? Does luck favor the prepared mind? Luck it turns out is simply thinking and behaving in certain ways that favor good fortune. According to Psychologist Richard Wisener of the University of Hertfordshire

of England, there are ways you can change your own form of 'luck'. If you feel you need to turn fortune your way, here are behavior patterns that you can apply to make it happen:

1. Remain open to new experiences. Do not get stuck in routine. Someone who relies on a set routine may not recognize an opportunity that could be beneficial.
2. Relax and observe everything around you to maximize your options.
3. Take advantage on situations where favorable developments occur. Determine probabilities and options, and if possible keep the risks in your favor.
4. Gather information before you need it. File it away as mental bookmarks for later use, and then apply the information when the time is right.
5. Learn from your mistakes, and find alternatives that could have been worse.
6. When you recognize a pattern of behavior or action, use your instincts to make decisions.
7. Expect good fortune and remain confident.
8. When something goes bad, try to find a benefit from the misfortune. Good or bad, life's experiences are lessons that prepare you for dealing with the unknown to be prepared to effectively seize opportunity.

The concept of luck is nothing more than positive thinking and situational awareness.

CARRYING THE FIRE

Common Mistakes in Marketing Emergency Services to the Public

As important as it is to market emergency services capabilities to our operational customers, we often make mistakes that can lessen the impact of the marketing effort. The seven most common mistakes that can occur are:

- Not identifying your potential customers
- Not investigating the needs of the customers
- No written marketing plan
- Not communicating directly with the customers
- Hindered by trying to be all things to all customers
- Burying the customer with inappropriate or insignificant data
- Not realizing the investment of time, effort and money it takes to demonstrate competency to your customers

Write up a working marketing plan to include how you are going to attain customers, demonstrate your operational capabilities and how you can best serve their needs on a continual basis.

Take the time to identify your potential customers and their particular needs that fit in with your capabilities. Do not offer what you cannot deliver. Do not fail to deliver what you promised.

When dealing with the customers, do not provide data that is inaccurate regarding the cost savings your services can offer. Often, in the exuberance of pleasing a client, such data can easily be over-stated. Customer relations depend on customer/client trust, and falsifying initial claims of performance can destroy that relationship before it can begin.

Pro-active marketing can greatly enhance emergency response opportunity, and it should be done with a written out marketing strategy.

THE ACE FACTOR

Real Time Leadership for the Sortie Commander

It is an inevitability that a Sortie Commander some day will be assigned to a team or crew that he or she has never worked with before. With the success or failure of a sortie on the line in the next four hours, it is important for the Sortie Commander to set the leadership tone as quickly as possible to provide the assigned team or crew every opportunity for success.

The Seven Essentials for Sortie Command Leadership:

1. View the mission from the strategic and tactical views. Know what you and your team/crew are going to do and how it impacts the overall mission objectives.
2. Communicate what the reality of the situation is to your team/crew. Explain it simply, totally, and clearly.
3. Clarify the role your team/crew will play in the mission and address any concerns members may have with conflicting values.
4. Reinforce the need to adapt to change. A significant rate of change within an emergency services operation should be expected.
5. Throughout the sortie, promote dialogue that involves everyone. Situational awareness involves a constant flow of information, input and feedback to be successful.
6. Monitor the stress level of the team/crew and try to control a balance of just enough stress to keep the team/crew at the top of their operational game.
7. Ensure that everyone is collectively responsible for the outcome of the sortie. Make assignments so that everyone is giving their best effort and supporting others. Hold everyone accountable for the results.

A new Sortie Commander to a team or crew can make some very basic mistakes that could jeopardize the outcome of the sortie.

- Resist the temptation to supply all the answers.
- Distinguish between internal problems and external assignments.
- Create self-confidence, not arrogance.
- Remember that the team/crew must commit to each other before they can commit to the sortie objective, or your command.
- Differing points of view are valuable, not problematic.

Allow the team/crew to do their job their way and support them when they err.

SURVIVAL SENSE

Group Survival

Most survival training is geared to the individual survival situation, but the same knowledge can be applied to a group survival situation. An individual must face the life-or-death circumstances alone, relying on personal knowledge, experience, and available equipment to use. The group has the advantage of collective wisdom, knowledge and experience, as well as the available

equipment. The major difference between an individual facing a life-or-death situation compared to a group facing the same situation, is in the group dynamic. An individual is the sole leader, follower, and 'keeper' of the desire to live. Group survival requires leadership from an individual, who has the added burden of trying to enhance the survival chances of people who may be unwilling to be led. Leadership by committee will likely delay critical decisions until a consensus can be reached. Selecting a leader who cares about the group is the key to success in a life-or-death situation.

A group leader in a life-or-death situation must assess the types of people in the group and their special needs:

- The strengths and weaknesses of each person must be assessed and carefully considered for determining what the group can do as a whole
- The capabilities of each must weigh in on any plan of action
- Members of the group may be dressed inappropriately for the weather or terrain
- Injured members can slow the group down and expose them to additional danger
- Depression and negative attitude from an individual can quickly affect the entire group

The group has the best chance for survival if it stays together and works as a team. Group integrity is the most important task a leader should undertake. It is up to the group leader to determine if it is safer to stay in place to be rescued, or to move to a better location. If staying in place is the group objective, the leader must keep the group together to work on a plan of action that includes a means for signaling, and keeping the spirits of the team high and the bodies dry.

If the objective is to move as a group to a new and safer location, it is up to the group leader to keep the group together, going no faster than the slowest member:

- Send the most fit member slightly ahead to find the best route around obstacles
- Assign a fit or non-injured member to accompany every unfit or injured member to assure they travel with the group and are not left behind
- Encourage the group to maintain a positive mental attitude
- The leader must maintain a steady pace, carefully negotiating every obstacle to get the group through together

POINT OF CARE

Emotional Problems Associated with Disaster Relief

If you and your team are the first responders to the aftermath of a disaster (such as for damage assessment), it will be common for you to come across people directly affected by the disaster approaching you for assistance. If there are any apparent injuries, it will be important to take care of the immediate medical concerns before any other assignment. You and your team can either direct and assist them to the closest medical care set-up, or if the injury is manageable, treat the injuries on site and call for medical assistance.

You are just as likely to come across victims of the disaster that are emotionally disturbed and seek assistance. Victims suffering from the emotional trauma should be treated calmly, but firmly. They should all be kept in small groups. It is preferred that these small groups are with people that know each other and can be encouraged to talk out their problems and provide self-support. It will be important that appropriate agencies are immediately notified to provide them assistance and counseling services. Until that assistance arrives, give the small group(s) something to do. If they are not injured themselves, enlist them to assist in the first-aid of those that are injured. Have the calm help soothe and comfort the over-excited. Anyone that has a stunned or dazed reaction that does not seem to be lessening should be reported to the nearest medical unit immediately. Never leave the emotionally disturbed to pursue your sortie assignment. An emotional injury associated with a disaster-induced trauma, can be just as debilitating as a physical injury or critical medical condition. Immediately following a disaster, the victims will need to know that help is there and the process of recovery is beginning. Your first minutes on site of a disaster response

may help in the emotional healing process. As soon as assistance arrives to take over control of the victims, you and your team can continue on with your mission sortie.

MISSION READY

Search Planning Part 2- Probability of Detection

There is a new concept in search planning and tactical operations that will soon be introduced by the Air Force Rescue and Recovery Center. In the as yet to be determined future, they will be requesting and discussing the "Probability of Success" or called 'POS'. The POS is a product of the Probability of Containment (POC) and the Probability of Detection (POD). In the previous issue (Vol. 2., Issue 6, Dec.2003), we discussed the POC. The POC is based on historic data where the location of a crashed aircraft can be predicted with a relatively high probability. We are now going to discuss the second part of the equation, the Probability of Detection (POD).

In search planning for an overdue aircraft, it is important to remember that establishing a probability is a planning function, not a search function. The previous model for POD used a combination of search altitude, track spacing, and visibility/terrain to be covered, for debriefing aircrews to establish their search probability after the search function. In the spirit of efficient management of resources, it is suggested that the Probability of Detection be used in the planning function. While a POC may help in establishing a likely search area when little information is known, the POD provides an assessment of how well the POC could have or should have been searched. The National Search and Rescue School in its 'Inland SAR Planning Course Book' (revised December 2001) describes the probability of detection (POD) as "the probability of the search object being detected, assuming it was in the area searched." It is a function of coverage factor, sensor, search conditions and the accuracy with which the search facility navigates its assigned search pattern. It measures the sensor effectiveness under the prevailing search conditions.

The POD is affected by many variables:

- Search Objective- type, shape, size, color
- Search Conditions- weather, visibility, time of day
- Search Area- terrain, surface vegetation, ground cover
- Search Crew- searcher capabilities, experience, fatigue
- Search Planning- search altitude, speed, track, spacing/sweep width

The search objective plays a prominent role in search planning to determine a probability from an observer perspective. If the objective is small, the probability of detection is lowered with a higher search altitude and/or wider search sweep width. When the search objective is small, the rule of thumb for a higher POD is for the search altitude must be lower with the sweep width and track spacing more narrow. Conversely, the same POD for a larger search objective can be obtained with a higher search altitude, wider sweep width and track spacing.

Probability of Detection from an aerial platform is dependent on the ability of the on-board observers to visually detect the search objective. The objectives can be readily spotted with contrasting shape, color, and/or motion. The key is to detect the objectives against the background. The search conditions are an important variable to visual acuity and under the wrong conditions can greatly affect the POD. Adverse weather can limit visibility as well as mask visual clues to the objective with fog, snow cover, and blowing snow/sand/soil, which can lower a POD. Even the time of day for the aerial search can affect visual conditions and a POD. An observer facing into the glare of the sun will have a lower POD than one who does not.

The search area terrain, vegetation, and ground cover can have a profound effect on the POD. Each can interfere with the detection of the search objective, or mask important clues. The POD

over flat terrain with limited vegetative growth will be higher than searching for the same objective in mountainous terrain with heavy vegetative cover.

The single most important variable is with the search crew responsible for the visual detection of the search objective. The training, experience, and fatigue level can greatly influence the POD. The aerial platform can be at the proper altitude, flying the ideal sweep width, in optimal weather conditions over flat terrain with limited vegetation, and poorly trained, tired observers may not spot and identify the search objective or important clues. The whole POD concept depends on the ability of the observers to detect and identify the search objective, and that depends on the visual sweep width from the aerial platform. The sweep width is defined as the measure of the ability of the observer to detect a specific target in the current environment. The sweep width is NOT the maximum distance at which an object could be spotted, nor is it the search width that will ensure detection. Sweep width is dependent on the conditions that are experienced and is an estimate of how well an aerial search CAN be conducted to provide a 'coverage factor'.

The following tables are obtained from the ICAO Search and Rescue Manual (4th Edition), 1994. The data in these tables are from extensive field-testing and experimentation:

Uncorrected Sweep Width (nm) for Visual Search of a Missing Light Aircraft					
Search Altitude (ft. AGL)	Visibility (nm)				
	3	5	10	15	20
500	1.0	1.4	1.4	1.4	1.4
1000	1.0	1.5	1.5	1.6	1.6
1500	1.0	1.5	1.8	1.8	1.8
2000	1.0	1.6	2.0	2.0	2.0

Uncorrected Sweep Width (nm) for Visual Search of a Vehicle					
Search Altitude (ft. AGL)	Visibility (nm)				
	3	5	10	15	20
500	0.9	1.3	1.3	1.3	1.3
1000	1.0	1.4	1.4	1.5	1.5
1500	1.0	1.4	1.7	1.7	1.7
2000	1.0	1.5	2.0	2.0	2.0

Uncorrected Sweep Width (nm) for Visual Search of a Missing Person					
Search Altitude (ft. AGL)	Visibility (nm)				
	3	5	10	15	20
500	0.4	0.4	0.5	0.5	0.5
1000	0.4	0.4	0.5	0.5	0.5

Coverage is a measure of the search effectiveness, relating to search sweep width and track spacing, which can determine how well a search area has been covered. This is used to determine POD of sweep searches. Coverage can also be used to determine the POD of effort within an area.

Sweep Search Coverage (C) = Sweep Width (W) / Track Spacing (T), or $C=W/T$

Area Coverage (AC) = Sweep Width (W) x Speed x Time / Area Searched *

* This calculation and discussion will be deferred to a future issue.

We discussed before that there are many variables affecting POD, such as search altitude, visibility, searcher fatigue, as well as area vegetation and terrain. The above tables discuss search altitude and visibility. The ICAO Search and Rescue Manual also provides information regarding the factors needed to correct the Sweep Width. Information regarding the efficiency of an observer/scanner is decreased with increased time in the aerial search platform is provided.

Sweep Width Correction Factors for Vegetation and Terrain				
	Flat or less than 15% vegetation cover	15-60% vegetation or hilly	60-85% vegetation or mountainous	Greater than 85% vegetation
Missing Aircraft	1.0	0.7	0.4	0.1
Vehicle	1.0	0.7	0.4	0.1
Missing Person	1.0	0.5	0.3	0.1

Crew Endurance Factor			
1 Hr. End	1.00	1 Hr. Avg.	1.00
2 Hr. End	0.91	2 Hr. Avg.	0.96
3 Hr. End	0.83	3 Hr. Avg.	0.92
4 Hr. End	0.75	4 Hr. Avg.	0.88
5 Hr. End	0.69	5 Hr. Avg.	0.85
6 Hr. End	0.63	6 Hr. Avg.	0.82

To determine the corrected sweep width, use the correction factors from the above tables. This corrected sweep width (Wc) is then used to determine the Coverage (C), which will lead to the calculated POD. The correction factors are applied according to the following calculation:

$Wc \text{ (corrected)} = \text{Uncorrected Sweep Width (Wu)} \times \text{Correction Factor} \times \text{Endurance Factor (Avg.)}$

The Coverage (C) would be calculated as $C = Wc / \text{Track Spacing (T)}$

To determine the POD from the Coverage (C), use the exponential equation $POD = 1 - e^{-\text{Coverage}}$

Or it can be extrapolated off the following chart:

POD Percentage Based on Coverage							
Coverage	POD%	Coverage	POD%	Coverage	POD%	Coverage	POD%
0.1	10%	0.6	45%	1.1	67%	1.6	80%
0.2	18%	0.7	50%	1.2	70%	1.7	82%
0.3	25%	0.8	55%	1.3	73%	1.8	84%
0.4	33%	0.9	60%	1.4	76%	1.9	85%
0.5	40%	1.0	64%	1.5	78%	2.0	86%

The POD Chart can be used to determine what the POD will be based on the projected search track spacing, sweep width, visibility, terrain, vegetation, and crew fatigue. Or, it can be used to select an efficient POD and determine what the optimum track spacing should be for the terrain and vegetation.

(An example exercise and problem using the POD calculations is located at the end of the newsletter for those wishing to try it out.)

Part III of this series will discuss the new version of 'Probability of Success', calculated from the 'Probability of Containment' and the 'Probability of Detection'.

DID YOU KNOW?

Stress that is Good for Your Health

Stress that is endured passively weakens your immune system. But, stress that demands active participation strengthens your immune system. Researchers at Ohio State University have been studying groups of people exposed to two types of stress, active and passive. Active stress was in the form of a group facing deadlines and memorization. Passive stress was in the form of a group watching media coverage of disasters and graphic surgery videos. After a period of time of exposure to the two types of stress, the groups were then tested for a specific immune-system protein that helps protect the body against bacteria and viruses. The group exposed to the active stress had higher levels of that protein. The group exposed to the passive stress had lower concentrations of the protein and were more prone to infection. According to research physician Jos A. Bosch, M.D., "Rather than finding ways to reduce stress, look for ways to increase the kind that will help keep you healthy."

Who knows, maybe Critical Incident Stress Management may be good for our health in more ways than we thought.

GOING FROM GOOD TO GREAT

Coaching Teams to Success

Great teams are seldom, if ever thrown together and are successful. It takes effort and solid training to build a team. A good leader of a well-trained team will in most cases out perform a randomly assigned team with a great leader. Situational awareness and success favor a well-built and coached team, under good leadership.

Ten Keys to Effective Team Building:

1. Define a team purpose
2. Use thoughtful recruitment
3. Establish a thorough orientation
4. Maintain solid internal communications
5. Select competent team leaders
6. Encourage participation by empowering team members
7. Monitor team morale, allowing fun to reduce stress
8. Establish mutual assistance
9. Recognize conflict as natural
10. Involve the team in goal setting to create ownership

Seven Keys to Effective Coaching of Teams:

1. Development takes place within individuals, coaching should help in an awareness for the need to improve
2. Opportunities provided for learning will help the individual to find satisfaction in the results of the effort to change
3. Help people to develop themselves
4. Establish a climate of confidence
5. Earn the respect of the team
6. Demonstrate by action that there is respect for all team members and confidence in their capacity to perform
7. Establish a system the team can believe in

Words of Wisdom- Coffee Cup Leadership Advice from the Military Pros

Do everything you can for the mission except compromise the lives of your men.

Never doubt that a small platoon of trained and committed soldiers can change the scope of the battle.

Luck favors the prepared mind.

Double check your cinch, saddle, and bridle before mounting for a charge. (from an old U.S. Cavalry saying)

FAMOUS QUOTES

There are two things a leader can do. Either he can contaminate his environment and his unit with his attitude and actions, or he can inspire confidence. (Lt. Gen. Harold G. Moore, USA)

CHECK IT OUT!

If you are interested in assessing your behavioral style, go to this website to explore multi-developmental assessments of behavior. Choose the site you like for a self-assessment of your particular style.

<http://www.nsba.org/sbot/toolkit/BehavSty.html>

'Behavioral Styles- Multi-Developmental Assessments'

SUBMISSIONS

Queries, suggestions, and news items are welcome. Please submit to the following addresses:

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Lincoln, NE 68516

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The next issue of the 'North Central Region Hawk' will be sent out on or about 15-April-2004. Please have information you would like to be considered in that issue to my attention no later than 01-April-2004.

Probability of Detection Calculations: Example Problem

The following calculations are used:

To determine POD % based on Coverage:

$$C = \frac{W_u \times CF \times E}{T}$$

To determine the ideal Track Spacing (T) based on an ideal POD%:

$$T = \frac{W_u \times CF \times E}{C}$$

To determine the ideal uncorrected Sweep Width (W_u) based on an ideal POD% to determine the best search altitude with set track spacing:

$$W_u = \frac{C \times T}{CF \times E}$$

$$CF \times E$$

*Example: An aircrew with a pilot, an observer, and a scanner assigned to fly a single back and forth sweep along the projected flight path as a route search for an overdue aircraft using **1 nm** track spacing. The assigned altitude is **1000 ft AGL**, with **10 nm** visibility. The projected area is **about 50% vegetation and hilly**. The crew is expected to be out for **2 hours**.*

From the 'Uncorrected Sweep Width for Visual Search for Missing Light Aircraft', with 10 nm visibility at a search altitude of 1000 ft. AGL: Uncorrected Sweep Width (**W_u**) = **1.5**

From the 'Sweep Width Correction Factors for Vegetation and Terrain', for 50% vegetation and hilly terrain looking for a Missing Light Aircraft: Correction Factor (**CF**) = **0.7**

From the 'Crew Endurance Factor', for a flight of two hours, the crew would average a correction factor (**E**) = **0.96** over the two hours.

$W_c = 1.5 (W_u) \times 0.7 \times 0.96$, therefore the Corrected Sweep Width = 1.008 rounded to the nearest tenth = 1.0 nm

The Coverage (C) would be calculated as $C = W_c / \text{Track Spacing (T)}$

Or as in the Example: $C = 1.0 / 1$, or the **C = 1.0**, and according to the POD% Table for Coverage, the projected POD = 64%.

If the Search Planners required a higher POD% (for example 80%), the POD% Table for Coverage would require a 1.6. If the search altitude would remain the same, what track spacing would it require?

Using the formula: $T = \frac{W_u \times CF \times E}{C}$ or $T = \frac{1.5 \times 0.7 \times 0.96}{1.6}$ or $T = \frac{1.008}{1.6}$

Track Spacing (T) = 0.63 nm, rounded to the nearest tenth, T = 0.6 nm.

In order to increase the POD% to 80%, at a search altitude of 1000 ft. AGL, the track spacing would have to be 0.6 nm for the one sweep route search.

Using the same requirements of a higher POD of 80%, what would the ideal search altitude using the tracking spacing of 1 nm under the same conditions?

Using the formula: $W_u = \frac{C \times T}{CF \times E}$ or $W_u = \frac{1.6 \times 1}{0.7 \times 0.96}$ or $W_u = \frac{1.6}{0.672}$

The Uncorrected Sweep Width, rounded to the nearest tenth, $W_u = 2.4$

According to the table for uncorrected search width with that visibility (10 nm), the ideal search altitude to obtain an 80% POD with a 1 nm track spacing for a single back and forth sweep of a route search would be 2000 ft. AGL.